

REISSUE

05/30/01  
Jc912 U.S. PTO

Attorney Docket No. JEL 29186C-RE-DIV4

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Inventor(s): Takashi YUKITAKE et al.

Serial No.: Divisional of Reissue  
Application No. 09/559,627

Filed: May 30, 2001

For: METHOD FOR DETERMINING MOTION COMPENSATION

REISSUE APPLICATION TRANSMITTAL

Assistant Commissioner of  
Patents  
Washington, D.C. 20231

Sir:

Attached is a divisional application of Reissue Application No.  
09/559,627. The following documents form a part of this submission:

1. A twenty-three (23) page specification including:

First and Second Pages of Original Patent

Columns 1-12 of Original Patent

Additional claims 4-11 (3 sheets)

Six (6) sheets of drawings (Figs. 1, 2A, 2B, 3, 4A, 4B,  
4C, 5, 6, 7A, 7B, 7C, 8) from Original Patent

Abstract

2. Copies of original Reissue Declaration, Statement under 37  
CFR 3.73(b), Assent of Assignee to Reissue, and Offer to

J1046 U.S. PTO  
09/866811  
05/30/01

09866811-053001

Surrender, all from parent Reissue Application No.

09/559,627.

3. Preliminary Amendment
4. Information Disclosure Statement with PTO-1449
5. Confirmation Claim for Priority

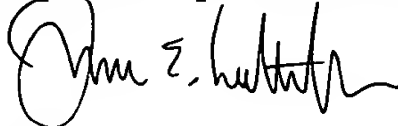
CALCULATION OF FILING FEES

(after cancellation of original claims by the attached preliminary amendment)

Basic Filing Fee	=	\$ 710.00
Total Claims 8 (Filed) - 20 (Allowed) = 0 (Extra) x \$18.00	=	\$ 0.00
Independent Claims 4 (Filed) - 3 (Allowed) = 1 (Extra) x \$80.00	=	\$ 80.00
Total Filing Fee	=	\$ 790.00

Please charge any deficiency in a overpayment of the filing fee to Deposit to Account No. 19-4375.

Respectfully submitted,



Date: May 30, 2001

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# METHOD FOR DETERMINING MOTION COMPENSATION

[This is a division of application Ser. No. 07/970,046 filed  
Nov. 2, 1992, now U.S. Pat. No. 5,369,449.]

This is a reissue continuation application of  
reissue application no. 09/559,627 (now U.S. Patent  
No. ), which is a reissue of United States  
Patent No. 5,745,182 issued April 28, 1998, which  
is a division of application Serial No. 07/970,046  
filed November 2, 1992, now U.S. Patent No.  
5,369,449 issued November 29, 1994. The following  
are related divisional reissue applications:  
application no. 09/833,680 filed April 13,  
2001, application no. 09/833,769 filed April 13,  
2001, and application no. 09/833,770 filed April  
13, 2001.

11046 U.S. PTO  
09/866811  
05/30/01

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

The present invention relates to a method for determining motion compensation of a moving image to be utilized in an apparatus which requires a prediction of a moving image such as an image transmission apparatus and an image apparatus.

### 2. Description of the Prior Art

With the progress of semiconductor technologies, methods for determining motion compensation to be utilized for a transmission of an image and a compression of an image have been widely used in many fields in recent years. Among such conventional methods for compensating for motion of a moving image, there is one method for compensating for motion of a moving image based on one piece of a reference image.

FIG. 6 is a diagram for showing the concept of the conventional method for compensating for motion of an image. Referring to FIG. 6, a moving image signal is a set of images which are sampled with an equal time interval  $T_0$  on the time axis. For example, an NTSC signal has images sampled at every  $1/60$  second for each field and a PAL signal has images sampled at every  $1/50$  second for each field. When a certain object of which images are to be picked up is moving, for example, the spatial position of an object A in an M-th image is deviated from the spatial position of an object A' in an (M-1)-th image by a portion of a move of the object during a period of  $T_0$ . Now, consider a case for predicting the M-th image from the (M-1)-th image. In order to make a determination of the M-th image with a high level of precision by compensating for motion of the object from an input image to a reference image during a time difference of  $T_0$ , the M-th image is divided into blocks including at least one pixel, and a move of each block from the (M-1)-th image to the M-th image is detected so that a pixel value of the image at a position deviated by the portion of this move is set as a determined value. This will be explained with reference to FIG. 6. To obtain a determined value of a pixel X of the M-th image, a pixel X' at the same spatial position as the spatial position of the pixel X in the (M-1)-th image is deviated by a detected move MV of a block unit including the pixel X, so that a pixel X'' is obtained. This pixel X'' is then used as a determined value of the pixel X. In FIG. 6 the block is assumed to have a size of  $3 \times 3$ .

When a signal is an interlace signal, there are many alternative cases considered for predicting compensation for motion of an image. For example, either a frame or a field is used for the image, and a frame is used for a reference image and a field is used for an input image, etc. The basic principle is as explained with reference to FIG. 6 above. As one of the examples of the above method for predicting motion compensation, there is Recommendation 723, "Transmission of component-coded digital television signals for contribution-quality at the third hierarchical level of CCITT Recommendation G.702" which was standardized by the CCITT (Commission Mixte CCIR/CCITT pour les Transmissions Televisuelles et Sonores 3). In this recommendation, a determination of motion compensation between frames and a determination of motion compensa-

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Inventors: Takashi YUKITAKE et al. ASSIGNMENT BRANCE

Serial No.: Reissue Application of  
U.S. Patent No. 5,745,182  
(Issued: April 28, 1998)

Filed: TBD

For: METHOD FOR PREDICTING MOVE COMPENSATION

OFFER TO SURRENDER ORIGINAL PATENT

The Honorable Commissioner of  
Patents and Trademarks  
Washington, D.C. 20231

Sir:

The undersigned Applicant of the above-captioned Reissue Application for the reissue of Letters Patent for METHOD FOR PREDICTING MOVE COMPENSATION, U. S. Patent No. 5,745,182, granted on April 28, 1998, of which Matsushita Electric Industrial Co., Ltd. is now sole owner by assignment and on whose behalf and with whose assent the accompanying application is made, hereby offers to surrender said Letters Patent. The original Letters Patent will be forwarded to the Patent and Trademark Office upon

notification that the Reissue Application is in condition for allowance. A soft copy of said patent is attached hereto for reference.

For and on behalf of

MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.



(Signature) Osamu Yamaguchi  
Director, Intellectual Property Center  
Authorized Signing Officer

(Name)

(Date)

(Title)